

PALESTINE



DEPARTMENT OF AGRICULTURE AND FISHERIES

ANNUAL REPORT

FOR THE YEAR

1940-41

(YEAR ENDED MARCH 31, 1941)



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GENERAL SURVEY.

There was a further intensification of the effort towards agricultural self-sufficiency, having regard to war-time needs. Government loans were utilised for the purchase and hire of tractors, the intensification of irrigation in the closely settled areas, and the diversification of farming in settlements. Weather conditions were favourable, the infestation of diseases was slight and the incidence of pests reduced. In addition the South and South-East and the Jordan Valley were fortunate in the amount of rainfall. From the combination of all these factors, and the increase in area during the 1939-40 sowing season made possible by a Government loan, the yields of both summer and winter crops were the highest since the Occupation, and by the beginning of the 1940-41 season stores of all varieties of grain were the largest ever recorded. Against this satisfactory state of affairs, however, must be recorded the poor condition of the citrus industry resulting from the detrimental effects of the war upon markets and shipping facilities, particularly after the entry of Italy as a belligerent.

SECTION I.

AGRICULTURE AND FISHERIES IN PALESTINE, 1940-41.

MAJOR CROPS AND INDUSTRIES.

The Citrus Industry.

Area under Citrus.

2. Further planting of citrus in 1940 was, as in 1939, negligible. Restriction of exports and lack of finance resulted in further areas being neglected and it was estimated that by the end of 1940 about 18,000 dunums of the total planted area of approximately 300,000 dunums had either been uprooted or abandoned. Further citrus planting is now subject to restriction under the Citrus Control Ordinance, 1940.

Citrus Cultivation.

3. Owing to the war-time conditions, the standard of citrus cultivation decreased but the loan granted in 1940 helped growers considerably in the maintenance of their groves. This loan was granted in respect of some 167,000 dunums, approximately £P.85,000 being loaned with full Government guarantee and £P.351,000 on two-thirds Government guarantee. The loan was given to owners of bearing groves in good condition on the security of the 1940-41 crop, there being a decided possibility when the loan was arranged that shipments would be effected as in 1939-40. The citrus area not assisted was largely made up of groves belonging to owners who did not require financial assistance, of groves not yet in bearing and of groves in bad condition the crops of which could not serve as security.

4. With the reduced standard, cultivation was largely restricted to essential irrigation and cultivation. In consequence, few groves were in good condition and in many, particularly those on lighter soils, the lack of manures was reflected in the yellow colour of the leaves. Dead wood was prevalent as a result of shortage of irrigation and lack of pruning.

One Palestine Pound (£P.) = 1,000 mils = One Pound Sterling.

One Dunum (metric) = 1,000 square metres = 0.2471 acre.

Throughout this report the term "Ton" means the metric ton of 1,000 kilogrammes.

5. Top working of grapefruit was continued, mostly to the Valencia orange but sometimes to Washington Navel orange or various mandarines. In most instances growers worked from 1 to 2 dunums at a time though in a few cases whole groves of 10 dunums or so were cut back for top working.

6. In view of prevailing conditions, many young groves were intercropped with cereals and other cash crops.

The Citrus Crop.

7. In 1940 bloom was heavy and, despite the May *Khamsins*, a fairly good crop was set. Whilst, without normal exports, early season estimates could not be verified, it was considered that the crop totalled around 11 million cases, of which 7 million cases of oranges, $\frac{3}{4}$ million cases of grapefruit and 100 thousand cases of lemons were thought to be suitable for export. The reduced standard of cultivation undoubtedly caused a larger proportion than usual of coarse, poor quality fruit.

Citrus Exports.

8. Exports during the season were on a very limited scale owing to the virtual closure of the Mediterranean route and the unsuitability of the long route via South Africa, apart from the general lack of shipping for export of citrus fruit. Exports were made mostly to the East and to meet Army requirements in the Middle East.

9. The exports made during the 1940-41 season are tabulated below according to total quantities and values. A fair quantity of Valencia oranges was also held in storage for delivery to the Army authorities in June and early July which brought up the total of orange exports for the 1940-41 season to some 160,700 cases :—

TABLE I.

EXPORTS OF CITRUS FRUIT—SEASON 1940-41.

As from 1st June, 1940, to 31st May, 1941.

	Oranges	Grapefruit	Lemons	Total
	Cases	Cases	Cases	Cases
Total Exports	95,099	14,243	461	109,803
	£P.	£P.	£P.	£P.
Total Values	49,000	6,100	200	55,300

10. Apart from limited exports through the port of Haifa, mostly to Libya, cased fruit exports were made principally by rail via Kantara.

11. In addition to the quantities tabulated above, exports in bulk, principally to Trans-Jordan and Syria, were equivalent to approximately 60,000 cases with a value of about £P.5,000.

12. The values given above are f.o.b. calculated at 8s. 6d. per case for all cased fruit other than Valencia oranges which were valued at 13s. per case. The 8s. 6d. value is made up of 5s. lifting expenses, 2s. 6d. Citrus Marketing Order fee and 1s. miscellaneous expenses and profit. With Valencias, the fruit had a value over and above the Citrus Marketing Order fee, and wastage during storage also had to be allowed for. The bulk fruit was valued at around £P.2.500 mils per ton of which £P.2 was the Citrus Marketing Order fee.

Local Sale of Citrus Fruit and Citrus Marketing Control.

13. In view of the limited export possibilities, and as the requirements of the Army for fresh fruit and bottled juice and those of the local by-products manufacturers totalled approximately 350,000 cases only, there was obviously a

very large surplus for which there was little chance of securing a market. Local marketing control was therefore introduced on 20th January, 1941, by the Citrus Marketing Board, the object being to ensure that, by charging a fee for disposal of more than 10 kilogrammes of fruit from a grove, at least a fair price should be paid for such fruit as could be sold, locally or for export; and that the net proceeds of such sales should be utilised in a way best calculated to serve the interests of the industry as a whole.

14. The fees imposed under the Citrus Marketing Order were at the following rates:— 120 mils per packed case, £P.2 per ton in bulk for human consumption, £P.1 per ton for by-products manufacture and £P.0.500 mils per ton for cattle fodder.

Citrus By-Products.

15. There was increased activity in the manufacture of by-products. The supply of containers (barrels and tins) improved as the season advanced. Increase in production was largely limited by the capacity of the existing factories, but with some extension of plant and by working at full capacity the output was increased. The principal products manufactured were raw and concentrated juice, essential oils and marmalade. A fair amount of essential oil was also produced by hand-operated machines in the groves; whilst this gave little, if any, return for the fruit, it at least provided the workers with a living wage. Steps were taken to begin manufacture of citric acid. At one time in the season there were hopes of securing large orders for the manufacture of ascorbic acid tablets from concentrated juice but unfortunately the price of the product was not competitive. It should be mentioned that there was an increased use of citrus fruit as fodder, cattle being fed an average of 20 kilogrammes per head per day.

Citrus Control Board.

16. Further to a draft Ordinance prepared early in 1940 by a Sub-Committee of the General Agricultural Council, the Citrus Control Ordinance, 1940, was enacted on the 18th October, 1940, and the members of the Board (3 official and 8 producer members) were appointed on the 17th December, 1940. The enactment of this Ordinance, which covers all the principal aspects of the industry except marketing, is an important advance in as much as it gives a large measure of self-government to the industry.

17. Under the Citrus Control Ordinance, which repealed the Fruit Export Ordinance and the Citrus Fruit Advertisement Ordinance, the Control of Export of Citrus Rules made under the Fruit Export Ordinance remained in force until amended or revoked by rules made under the Citrus Control Ordinance.

18. The Chief Horticultural Officer, who was Chairman of the Citrus Fruit Committee, was deputed by Government to perform the duties of Acting Manager of the Board and, as such, carried out much of the preliminary work involved in the establishment of the Board.

19. The Board held its first meeting on the 23rd December, 1940, and proceeded without delay to acquire offices, to appoint staff and to proceed with the registration of all citrus groves in the country.

20. Eight meetings of the Board were held before the end of March, 1941, and, apart from the questions mentioned above, the principal matters discussed were: questions arising out of the marketing control, Government assistance to growers, stocks of packing materials and disposal of the surplus crop on the trees.

Citrus Marketing Board.

21. The appointment of the Citrus Marketing Board under the Defence Regulations was gazetted on the 19th December, 1940. Its functions were to take such steps as were deemed necessary to control or regulate the marketing of the 1940-41 citrus crop. The Board consists of 2 official and 2 non-official members; one of the two Joint Secretaries of the Control Board was appointed as Secretary of the Marketing Board. The Marketing Board held ten meetings prior to the end

of March, 1941, and the marketing control measures undertaken have already been briefly reviewed. After drafting the Citrus Marketing Order and subsequent minor amendments, the principal matters considered by the Board were problems arising out of operation of the control, particularly as regards checking of transport of fruit, and arrangements for supply of citrus fruit under contract to the Army. Officers of the Department of Agriculture also assisted in the Army contract arrangements.

Government Relief to the Citrus Industry.

22. Apart from loans to citrus growers, as a further measure of relief to the industry the rate of Rural Property Tax for citrus was reduced to nil throughout the country for the 1940-41 year beginning in April on account of the considerable reduction in crop value. The rate of tax for citrus had been previously reduced for the 1939-40 year from 400 mils to 150 mils per dunum except in the Acre Sub-District where the rate was maintained at 40 mils per dunum; for the 1939-40 year, the tax was remitted on groves recorded as being heavily infested with *Pseudococcus comstocki*.

Wheat.

1939-40 Season.

23. The result of the seed loan of £P.30,000 was an extension of area, and the excellent weather conditions and the lightness of the attacks by field mice and *Syringopais temperatella* led to a record yield of some 136,000 tons. Prices fluctuated slightly during the year but did not go beyond £P.12 a ton.

1940-41 Season.

24. The continuance of and increase in the loans to farmers in 1940 caused a considerable increase in area. The season opened early with good rains. A crisis came later when a complete absence of rain in February saw many crops ruined in the Beersheba area and in a precarious condition elsewhere. A heavy rain in the beginning of March and towards the close of the month saved the situation as at the close of the period to which this report refers. There was a firm demand in all parts of the country for half-hard wheats producing a white flour.

Barley.

1939-40 Season.

25. As with the wheat crop, the barley yield was very heavy and both the normal and estimated yields were greatly exceeded. Returns in the Beersheba district were far above the average, and the total yield for the country was about 102,000 tons.

1940-41 Season.

26. Notwithstanding the good commencement of the 1940-41 season the dry conditions of February ruined any prospects of a harvest in the Beersheba area and it was apparent that however much rain fell in March nothing could resuscitate the majority of the crops in the southern areas. In the northern and coastal region crops looked well at the close of March.

Pulse Crops.

27. Of the staple pulses, horse beans alone showed poor results. Prices for beans, peas, lentils, vetch and *kersanna* were firm throughout the year.

Vegetables.

28. Vegetables showed a remarkable increase in production. A great deal of land under irrigation in the vicinity of groves was utilised for vegetables.

Jewish farmers, through co-operation and organised marketing, packing and grading, kept regular supplies on the market at stable prices. In hill areas of the Ghor region Arab cultivators have increased the area under vegetables by at least 40 per cent. in the past two years. Seed production in both Government and private centres has been stimulated.

Summer Crops.

29. Germination of maize, sesame, dura and chick-peas was extraordinarily good throughout the country and heavy yields of grain were reaped. The two maize crops in the Huleh area were good.

Forage Crops.

30. Particular attention was given to the production of forage crops of *berseem*, lucerne, maize and cowpeas, while the recent introduction of beans, peas, *setaria* and sweet lupins gave promising returns. Trials of mixed pasture of lucerne, Rhodes grass and *paspalum* put down at one settlement in the coastal plain proved so successful that within the year 18 other settlements had laid down considerable areas under a similar mixture. Demands from the military forces for hay resulted in extensive areas being put under oat and vetch mixture and "fahl" *berseem* (a single-cut *trifolium* sp.).

Potatoes.

31. The spring crop was heavy, and autumn liftings very fair. The supplying of seed presented difficulties which were not entirely overcome; 260 tons were imported from Syria for winter sowings and arrangements were made for a shipment from the United Kingdom which arrived shortly after the close of the period under review.

Crop Yields.

32. Estimated crop yields for the year were:—

Wheat	136,000 tons.
Barley	102,000 tons.
Beans	3,200 tons.
<i>Kersanna</i>	11,000 tons.
Lentils	5,200 tons.

Fruits other than Citrus.

Deciduous Fruits.

33. Continued interest was shown in the planting of pome and stone fruit trees. In general, weather conditions in 1940 were favourable for foliation, blossoming and fruit setting; the crops of some apricot, plum and local apple varieties suffered from *Khamsin* weather. Losses on account of pests and diseases were variable; the attack by the Mediterranean fruit fly, particularly on the stone fruits, was severe and many stone fruit growers are becoming discouraged by losses on account of this and other pests and diseases. Prices were generally higher than in recent years owing to limited imports; some 17,000 boxes of apples were cold stored with success; small lots of plums which were cold stored did not keep well. Following a warm winter, foliation and blossoming in the spring of 1941 was irregular; spraying to promote foliation is becoming more general.

Olives.

34. The 1940-41 olive crop was generally very good. Production of oil was estimated at 10,000 tons and it is considered that some 4,000 tons of olives were

pickled. About 2,000 tons of oil were used by the local soap industry. Infestation by the olive fly was not serious and consequently high yields of oil of good quality were obtained. Prices were high: edible oil £P.50—£P.75 per ton; industrial oil £P.35—£P.50 per ton. Improvement in production of good quality oil was encouraged by demonstrations and an olive oil competition. A film showing proper methods of olive culture and oil production was also prepared. Demands for planting exceeded the supply; the interplanting of young olive trees with vines is becoming more general.

Bananas.

35. The area under bananas increased. Yields in 1941 were generally high. Prices, which were low early in 1940 owing to Syrian imports, became satisfactory as from the autumn; first grade green fruit sold at 12—20 mils per kilo and second grade fruit at 9—10 mils per kilo. The monthly production now ranges from 500 to 1,000 tons according to season.

Grapes.

36. The grape crop was normal (Hebron area, very good; Ramallah and Jerusalem areas, average; the settlements, good). The unirrigated coastal crop suffered somewhat from *Khamshins*. The season which, with newly introduced early varieties such as Perle of Czaba in the Jordan Valley, began at the end of May, lasted until end of November. Prices were good at from 6 to 10 mils per kilo. About 6,000 tons of grapes were used by the wine cellars. Raisin production was demonstrated but little interest was shown with the good fresh fruit prices.

Sub-Tropical Fruits.

37. Further planting of figs was carried out; much interest was shown in the demonstration of packeting of pressed dried figs. Other sub-tropical fruits such as loquats, mangoes, dates, anonas, etc. are in increasing demand.

Poultry and Beekeeping.

38. Decreased imports of poultry and eggs were made good to some extent by increased local production, and poultry farming was extended, although less markedly than in previous years. Poultry farmers came through a difficult year of widely fluctuating poultry foodstuff costs and produce prices with a substantial profit. Duck-raising is growing increasingly popular on modern farms. Geese and turkey rearing have been given considerable attention by farmers and rabbit-keeping, primarily for meat production, has developed considerably. An outbreak of fowl plague occurred during the spring of 1941, and was successfully dealt with, but severe financial loss was experienced in a few cases. There were no other serious disorders during the year. Although breeding stock at Government Poultry Stations has been increased considerably the great demand for the various breeds could scarcely be satisfied. Long-term experimental projects were continued, while new ideas were introduced, particularly into problems of poultry-feeding and housing.

39. In order to increase the poultry population on Arab farms, two modern hatcheries each of 50,000 egg capacity were established by Government. Native eggs only were hatched and the chicks, which were disposed of at a nominal price, found a very ready market. This scheme was supplemented by an energetic plan to introduce home-made fireless brooders in which to rear the chicks. The brooders proved very popular and considerable success has been achieved.

40. Duty-free sugar was again issued to bona-fide beekeepers at the rate of 10 kilogrammes per populated moveable-frame hive. The campaign against hornets, and bee-diseases was also continued. The honey-flow was not unfavourable and the total yield of 400 tons of honey was about the same as in the previous year. No difficulty was experienced in marketing it all locally at the rate of 60 mils per kilogramme.

Fisheries.

41. In the year under review the total catch of fish from the sea and from inland waters was 2,000,000 kilogrammes valued at about £P.70,000.

42. Landings by local fishermen from both the sea and from inland waters achieved record figures. Landings by foreign trawlers amounted to less than 50 tons or 3 per cent. of the total. This is the lowest figure for a good many years and is a direct result of the cessation of fishing by Italians. The increased local production is mainly accounted for by increased landings of sardines. Had there been no war-time restriction on lampara fishing with lights at night, the catches of sardines would have been still greater.

43. The main progress in the fisheries of Palestine during the year was in the intensive pond culture of fresh water fish for the Jewish markets. The young industry, introduced from Central Europe by people from that region, has great potentialities for Palestine. Carp thrive remarkably well and are greatly prized by the Jewish population. Their feed, however, is expensive and research may indicate that a system of fish-culture, based more closely on the Far Eastern mode, is more economic, species of fish being used that will thrive on less expensive food such as green vegetation (grass, banana leaves, etc.) rather than on maize, lupin seeds, etc., as used for carp. The produce of the new carp ponds was 18 tons. In coming years this item is likely to increase rapidly with the growth in area of the ponds. At the close of the year the total area of ponds was 518 dunums, the producing area during the period being 233 dunums.

44. For the fourth year in succession the total number of licensed fishermen has increased. The number of licences issued in the year was 1,663. This total excludes fishermen on foreign trawlers, those fishing on private waters (carp ponds, etc.) and those covered by the exclusive licence of the Lake Huleh concession. 52 fishing vessels on Lake Tiberias were licensed during the year.

45. Imports of fresh and frozen fish from Egypt and Iraq showed a slight increase, but the total import decreased by about 60 per cent. as compared with the preceding year. Prices were high. Species of fish that in the past have usually been considered as first quality have appeared on the market in relatively smaller quantities than in former years, while second quality fish such as sardines and dogfish have taken a much more prominent position.

46. Fish bombing, and the landing of undersized fish, are still very widespread and require much more energetic counter-measures.

47. A loan of £P.2,700 was made by Government for the conversion of 5 tugs to small trawlers. Further loans were approved in principle for the construction of new areas of fish ponds and to assist in the supply of fishing gear to coastal fishermen.

48. Three small local trawlers were at work during the year.

49. The Aqaba fishery undoubtedly has great potentialities once the initial difficulties have been overcome. The chief of these is transport. From October 1940 to March 1941 a total quantity of about 25 tons net weight of fish in ice reached Palestine markets from Aqaba via the Trans-Jordan route.

50. There has been some progress in the spread of new fishing methods both in the sea and fresh water fisheries. Preservation of fish by canning and smoking is undertaken in a small way.

Research.

51. A study of the detailed biology of the fresh water fish, particularly of Lake Tiberias, was started in December 1940. This work must form the basis for a rational policy for the lake. Research on marine fishing methods was also quickened.

52. The organisation of fishermen into co-operative groups show little progress, but the work is kept entirely to the fore.

SECTION II.

WORK OF THE DEPARTMENT OF AGRICULTURE AND FISHERIES AND OF THE GENERAL AGRICULTURAL COUNCIL.

Establishment of Department at Close of Year.

Director	— Captain F.R. Mason.
Deputy Director	— Mr. D. Stedman Davies.
Chief Agricultural Officer	— Mr. G.G. Masson.
Chief Horticultural Officer	— Mr. A.C. Shill.
Chief Plant Protection Officer	— Dr. J.E. Hardy.
Chief Fisheries Officer	— Dr. G.C.L. Bertram.

Agricultural Service.

53. The agricultural stations of Majdal, Kafr I'nán and Ein Arrub, were re-opened after having been leased to local farmers in the previous year. In the rotational system areas were sown to selected cereals and leguminous crops. Destroyed buildings were reconstructed by the Public Works Department. The normal work of the Acre and Jericho Stations was carried on throughout the year. At Beersheba Dry Farming Station the extensive cultivation work with modern implements resulted in the production of the best crops in the district. Small areas in horticultural stations at Sarafand and Nablus were utilised for vegetable seed and seedling production. The output from these was satisfactory.

54. All demonstrational and a certain amount of experimental work was continued throughout the country in manurial, irrigation and varietal tests on cereal, vegetable and forage crops. Seed breeding and testing on selected farms from grain supplied by Government Stations is materially assisting in the dissemination of a high quality seed throughout the country.

Horticultural Service.

Horticultural Stations.

55. Work has proceeded normally at the stations at Acre, Sarafand, Nablus, Farwana, Jericho and Ein Arrub; at some stations much restoration work was necessary. Full activities were resumed at Farwana and Ein Arrub in April, 1940. New plantings include: stock studies of new citrus varieties (Sarafand), oil and pickling olive varieties (Acre), banana method of planting study (Jericho), and a plum stock study (Ein Arrub). Some work was restarted at Majdal where an experimental vineyard was planted; Farradiya Station has not yet been re-opened but undamaged plantations of vines, carobs, figs and olives are being maintained. The work at the Stations is already yielding valuable information which is of assistance in giving advice on matters such as stocks for various citrus varieties, irrigation application, banana planting methods, effect of stock on vine yields, methods of pruning local and European vines, etc. A study of methods of top-working citrus was carried out at Acre and trials of vegetative propagation of olives were begun at Sarafand.

Fruit Tree Nurseries.

56. The principal distribution of the nursery work was: deciduous trees and vines, Acre; sub-tropical trees, Sarafand and Jericho; and olives, Nablus. In 1940-41, 31,685 grafted vines were produced of which 31,122 were distributed, and 34,267 fruit trees (mostly deciduous) were produced of which 29,952 were distributed.

Other Horticultural Activities.

57. Apart from routine advice to farmers regarding varieties, stocks, pruning, soil erosion control, etc., the Horticultural Officers devoted much of their time to

encouraging production of by-products, particularly olive oil, pickled olives, dried figs and raisins. In addition to lectures and demonstrations to farmers, 10 broadcast talks were prepared during the year. Investigational work was undertaken in connection with oil content of various olive varieties, factors affecting acidity in olive oil, chlorosis in nurseries, grape maturity standards, and ploughing methods in orchards to reduce soil erosion. Inspection of private nurseries was carried out as required.

Fruit Inspection Service.

58. During the period between the end of the 1939-40 export season in May, 1940, and the commencement of marketing control in January, 1941, the regularly employed staff of the Fruit Inspection Service was principally engaged on completion and revision of the general citrus survey and on a re-survey of the area infested with *Pseudococcus comstocki* which was first surveyed in 1939. During the summer of 1940, the three Fruit Inspectors carried out a large number of grove inspections in connection with the 1940-41 citrus loan and reported their findings to the Loans Committee. At the end of 1940 the Service assisted in arranging for supply of local fruit under contract to the Army. From January, 1941, to end of the year under review, the staff was mostly engaged on routine work (collection of fees, etc.) in connection with the Citrus Marketing Order.

Inspection of Fruit.

59. The usual inspection of fruit for export was carried out as required. In addition, fruit for delivery to the Army, either locally or to Egypt, which would ordinarily be exempt from inspection, was also inspected at the request of the Army authorities and by arrangement with the contractors concerned.

Pseudococcus comstocki Survey.

60. This survey revealed that, whilst the area infested was greater than in 1939, the infestation was generally less severe. It seemed that this reduction in intensity of infestation was largely attributable to the hot dry *Khamsin* weather in May. The results of this survey are tabulated below together with those of 1939:—

	1939	1940
	dunums	dunums
Heavy infestation	3,592	790
Medium infestation	5,677	4,628
Light infestation	16,642	29,023
Total area infested	25,911	34,441
Total area surveyed	71,680	140,000

The infested area lies almost exactly inside a line joining Herzeliya, Magdiel, Lydda, Aqir, Mughar and Yibna.

General Citrus Survey.

61. The general citrus survey was continued in the Tulkarm and Gaza areas; 5,604 dunums being surveyed. Revision of the previous survey records was also carried out in respect of 33,789 dunums in the Ramle and Haifa Sub-Districts; these areas were first surveyed in 1936 and many changes were recorded.

Citrus Marketing Order.

62. In connection with collection of fees under the Citrus Marketing Order, offices at Haifa, Acre, Nazareth, Benyamina, Hadera, Tulkarm, Petah-Tiqva, Tel Aviv, Jaffa, Ramle, Rehovot and Gaza were staffed by officers of the Fruit Inspection Service who also attended part time at offices at Tiberias, Affula and Pardess Hanna. Offices at Jericho and Nathanya were staffed by other Government officers.

Citrus Wastage Investigation.

63. The research work on citrus fruit wastage, which is carried out at the Jewish Agency Agricultural Research Station, Rehovot, was continued during 1940-41 with a reduced expenditure of £P.1,538. (£P.1,800 in 1939-40). Such schemes of work, which were previously financed by the Citrus Fruit Advertisement Fund, will in future be arranged by the Citrus Control Board. A detailed report on this work is in course of preparation for presentation to the Citrus Control Board.

Plant Protection Service.

Identifications.

64. In the beginning of the year one consignment of insects was sent to the Imperial Institute of Entomology for identification and five consignments of identified insects were received; these comprised 69 species of which 12 were of economic importance and 3 new to the British Museum. Since then consignments have been withheld. The Chief Plant Pathologist of the Agricultural Research Station at Rehovot made 47 identifications of diseased plant material.

Research and Investigations.

65.—(a) The *Pseudococcus* species which has caused such heavy damage in the last two years has diminished considerably in the infested groves but on the other hand is undoubtedly spreading through the country. It has been established that this insect can give rise to 5-6 generations throughout the year.

The natural decrease of this pest has made it difficult to assess the value of the control methods which have so far been applied but, on the basis of small scale experiments made last year, some large field trials indicate that a measure of control can be obtained by spraying.

The hymenopterous parasite, *Clausenia* spp. which was introduced into the country from Japan is being bred on a small scale and 10,000 adults were liberated. Recoveries from the field have been made showing that some establishment has taken place but there are, as yet, no indications as to the value of *Clausenia*. The entomologists of Rehovot have been co-operating on the biological control side of this problem and are completing a survey of the local parasites and their biology. Rehovot have also introduced *Cryptolaemus montrouzieri* for studies on the efficaciousness of this predator under Palestine climatic conditions.

(b) *Deciduous Fruit Trees.* The Capnodis investigations have continued and it has been discovered that newly-hatched Capnodis larvae are unable to penetrate finely sifted dry soil or dry sand. As a result of these experiments a possible method of control consisting of the application of dry sand round the base of the fruit tree is being tested at the Capnodis Station and will receive large scale field trials throughout the country in the coming year.

Further experiments with spot sprays containing copper carbonate or sodium fluosilicate for use against Mediterranean Fruit Fly were developed. An endeavour to counteract burning in areas where dew forms was made by incorporating zinc sulphate or ammonium bicarbonate with the copper carbonate, and magnesium oxide with the fluosilicate, but the results were not wholly satisfactory when used on stone fruit trees.

Control experiments against *Parlatoria oleae* have been made with considerable success; preliminary experiments were started for the control of *Virachola livia* on pomegranates by the use of sprays; the spraying experiments against the codling moth continued.

Fluosilicate compounds were used as dusts in experiments to control *Polychrosis botrana* on grape vines; a satisfactory degree of control was obtained and fluoride residues neither exceeded the limit laid down in the Provisional Health Standard nor affected the quality of the wine.

(c) *Cereals and allied crops.* The investigations on *Syringopais temperatella* were continued and it is becoming increasingly evident that where deep summer ploughing cannot be performed some sort of crop rotation must be adopted. Preliminary observations on the dura and maize borer, *Sesamia cretica*, indicate that the destruction of the stubble before the following spring should be adopted as part of cultural practice.

(d) *Stored Grain Pests.* After meetings with the Rehovot Agricultural Station a plan of work to co-ordinate the investigations was drawn up. Observations on the biology of some of the pests have been made and a small silo was constructed for observations on treated and untreated grains.

Plant Pathology.

66. Experiments directed against the damping off of tobacco seedlings by *Fusarium* have so far shown that boiling water suitably sterilises the soil, while Bordeaux power and silver nitrate are the best disinfecting agents for the soil and seed respectively. Leaf curl on peach trees by *Tephрина deformans* was treated by lime sulphur as a winter wash. Experiments against *Tilletia tritici* and *Ustilago hordei* on wheat and barley were continued from last year.

67. Cuttings and seedlings taken from *Antirrhinum* plants apparently immune to *Puccinia antirrhini* have reproduced flowers with the parental colours and to date have been immune from attack.

68. Some demonstrations against mildew, leaf spots and scabs on plants were carried out. Routine identifications have been made including examinations of diseased vines in Trans-Jordan at the request of that Government.

Extension.

69. The Extension Officer gave 45 demonstrations to farmers on methods of controlling pests amongst which were Vine Bud Moth, Plum Saw Fly, Codling Moth, Fruit Fly, etc. In addition field trials were conducted against whitefly, scales of fig trees and peach twig borer. Liberation of *Aphelinus mali* against Woolly Aphis was made in seven orchards. Individual requests for advice were attended to by the branch.

Plant Quarantine.

70. A total of 4,246 incoming consignments of plants were examined at the ports, railway stations and Post Offices. Of these 295 were fumigated before entry was permitted and 56 were confiscated. 564 consignments for export were inspected and 233 of these fumigated.

71. Eleven Plant Protection Guards were re-appointed making a total of 17 guards by which the regulations of nurseries have been enforced. 57 nurseries are now licensed for distribution of the products; 18 new nurseries were registered during the year.

Kadoorie Agricultural Schools.

72. The increasing number of applications for admission to the Kadoorie Agricultural School, Mt. Tabor, indicates a growing recognition of its services to the community. The 28 students admitted to the first year class came from 16 settlements of different types and three towns distributed from the extreme north of Palestine to the south. In addition to their courses of study the students performed the bulk of the farm work under the supervision of the staff and trained workers, and much of the responsibility for arranging and carrying out the work has been placed upon the shoulders of the students in order to develop initiative and independence. Out of 22 second year students, 18 were fully successful in examinations, while 24 out of 28 first-year students passed the examinations for promotion to the second-year classes.

73. About 65 dunums of very fertile land were reclaimed, zizyphus trees, shrubs, and rocks being removed and a road built. Satisfactory results were reported by all sections, including cannery, nursery, stock, dairy and poultry.

74. The Kadoorie Agricultural School, Tulkarm, remained occupied by the military until the 29th March, 1941, and by the close of the period under review the Principal had completed preliminary arrangements, as far as was possible, for a refresher course for students who had already completed their first year, and for the full re-opening of the School in the coming autumn.

General Agricultural Council.

75. The Council held five meetings during the year. Among a variety of subjects it considered at length certain implications of the draft bill for establishing the Palestine Citrus Control Board, and the main aspects of the citrus industry under war-time conditions. Seven meetings of the Committee on Agricultural Economics and Marketing, and six meetings of the Citrus Fruit Committee were held. The latter committee and the Citrus Fruit Advertising Committee functioned up to the time of the enactment of the Citrus Control Ordinance and in July, 1940, a Subcommittee of the Citrus Fruit Committee was appointed to deal with citrus matters pending the establishment of the Citrus Control Board.

SECTION III.

AGRICULTURAL LEGISLATION.

76. The most important legislation was the Citrus Control Ordinance, to which earlier and fuller reference is made in paragraphs 16 to 20 in this report. Apart from the Citrus Control Ordinance and the various Orders published in connection with the marketing control exercised by the Citrus Marketing Board, the export rules were amended by the Control of Export of Citrus (Amendment) Rules (No. 2), 1940, which clarified the position as regards date of export of early varieties of oranges, revised the dimensions of cases and the counts to be packed in the various cases, and exempted lemons exported to Turkey from the provisions of the rules.

77. New fishery legislation appeared very early in the year (Fisheries (Amendment) Rules 1940). These rules applied to the granting of duplicate licences in the event of the loss of originals, the decrease of legal mesh sizes, and the imposition of prohibited fishing areas during certain seasons in Lake Tiberias. Later amendments were designed to provide proper control over fishing in natural areas of fresh and brackish waters (other than Lakes Tiberias and Huleh).

F. R. MASON

*Director of Agriculture
and Fisheries.*

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